We claim:

1. A drug delivery molecule comprising:

a polymerized carboxylic acid molecular scaffold having a plurality of free carboxylic acid groups;

a plurality of biologically active molecular modules, each being covalently linked to the same polymerized carboxylic acid molecular scaffold, wherein said active modules comprise:

at least one targeting module for promoting cellular uptake by a target cell; and

at least one pro-drug module for altering cellular metabolism of the target cell.

2. The drug delivery molecule according to claim 1, wherein the pro-drug is selected to inhibit expression of tumor-specific proteins.

3. The drug delivery molecule according to claim 1, wherein the polymerized carboxylic acid molecular scaffold is poly (β-L-malic acid).

4. The drug delivery molecule according to claim 3, wherein the poly (β-L-malic acid) has a molecular mass between 2,500 and 100,000.

5. The drug delivery molecule according to claim 4, wherein the poly (β-L-malic acid) has a molecular mass of at least about 5,000.

6. The drug delivery molecule according to claim 1, wherein each molecule of the polymerized carboxylic acid molecular scaffold has at least about 50 free carboxylic acid groups.

7. The drug delivery molecule according to claim 1, wherein the plurality of molecular modules further includes a molecular module for promoting disruption of biomembranes.

8. The drug delivery molecule according to claim 7, wherein said molecular module for promoting disruption of biomembranes comprises a molecule having lipophilic characteristics and groups that are charged at physiologic pH and become uncharged at lysosomal pH thereby increasing lipophilicity of said molecular module.

9. The drug delivery molecule according to claim 1, wherein the plurality of active molecular modules further includes a molecular module for prolonging circulation of the drug delivery molecule.

10. The drug delivery molecule according to claim 9, wherein the molecular module for prolonging circulation of the drug delivery molecule comprises polyethylene glycol.

11. The drug delivery molecule according to claim 1, wherein the plurality of active molecular modules further includes a reporter module for determining cellular uptake of the drug delivery molecule.

12. The drug delivery molecule according to claim 11, wherein the reporter module comprises a fluorescent molecule.

13. The drug delivery molecule according to claim 1, wherein the targeting molecule is selected to promote penetration of the blood brain barrier.

14. The drug delivery molecule according to claim 1, wherein the targeting molecular module comprises an antibody.

15. The drug delivery molecule according to claim 14, wherein the antibody binds to a transferrin receptor.

16. The drug delivery molecule according to claim 14, wherein the antibody is a monoclonal antibody.

17. The drug delivery molecule according to claim 14, wherein the antibody is a humanized or chimeric antibody.

18. The drug delivery molecule according to claim 1, wherein the pro-drug molecular module is linked to the polymerized carboxylic acid molecular scaffold by a cleavable linkage that is cleaved when the drug delivery molecule enters a cell.

19. The drug delivery molecule according to claim 18, wherein the cleavable linkage is a disulfide linkage.

20. The drug delivery molecule according to claim 1, wherein the pro-drug molecular module comprises an antisense molecule.

21. The drug delivery molecule according to claim 20, wherein the antisense molecule is a morpholino antisense molecule.

22. The drug delivery molecule according to claim 20, wherein the antisense molecule interferes with production of laminin-8.

23. The drug delivery molecule according to claim 22, wherein the antisense molecule interferes with production of laminin-8 by altering production of a laminin subunit selected from the group consisting of α4 laminin and β1 laminin.

24. A method of synthesizing a drug delivery molecule comprising the steps of:

providing a polymerized carboxylic acid molecular scaffold having a plurality of free carboxylic acid groups;

activating the carboxyl groups;

reacting the activated carboxyl groups with a compound containing sulfhydryl groups and amino groups to add sulfhydryl groups to the drug delivery molecule to make a sulfhydryl-drug delivery molecule;

reacting a targeting molecule containing a sulfhydryl binding group with the sulfhydryl-drug delivery molecule to promote uptake by a target cell; and

reacting a pro-drug molecule for altering cellular metabolism of the target cell.

25. The method of synthesizing a drug delivery molecule of claim 24, wherein the pro-drug molecule is an antisense molecule containing a sulfhydryl binding group.

26. The method of synthesizing a drug delivery molecule of claim 24, further comprising a step of reacting the activated carboxyl groups with a molecule with a lipophilic portion and containing charged groups which become uncharged during acidification of endodomes thereby causing membrane disruption.

27. The method of synthesizing a drug delivery molecule of claim 24, wherein a plurality of different pro-drug molecules are linked to the same drug delivery molecule, thereby allowing simultaneous treatment of the target cell with more than one pro-drug molecule.

28. The method of synthesizing a drug delivery molecule of claim 24, wherein the targeting molecule is selected to promote penetration of the blood brain barrier.